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CENCR-PD-F (1105-2-10b)

MEMORANDUM FOR: Commander, North Central Division, ATTN: CENCD-PD-PF (Austin),
536 South Clark Street, Chicago, Illinois 60605-1592

SUBJECT: Definite Project Report and Environmental Assessment for Section 14
Emergency Streambank Protection, Mazon River, Whitetie Road, Goose Lake
Township, Grundy County, Illinois (CWIS No. 92345)

1. INTRODUCTION

a. The following letter report is a summary of a study made on providing emergency streambank protection along the right descending bank of the Mazon River to curtail erosion which is causing damage to Whitetie Road, and is currently threatening destruction.

b. The proposal for emergency streambank protection presented in this report recommends the placement of riprap along approximately 600 linear feet of the right downstream bank of the Mazon River. The total estimated cost for the project is \$315,625, with a benefit-to-cost ratio of 1.3. The project satisfies the criteria for Federal participation and is recommended for construction.

Keywords: Embankments, Flood Control. (AW)

2. STUDY AUTHORITY

The authority for this study and report is Section 14 of the 1946 Flood Control Act, approved 24 July 1946, as amended by the Water Resource Act of 1986. The authority, as amended, is presented as follows:

That the Secretary of the Army is hereby authorized to allot from any appropriations heretofore or hereafter made for flood control, not to exceed \$12,500,000 per year, for the construction, repair, restoration, and modification of emergency streambank and shoreline protection works to prevent damage to highways, bridge approaches, and public works, churches, hospitals, schools and other non-profit public services, when, in the opinion of the Chief of Engineers, such work is advisable: Provided, that not more than \$500,000 shall be allotted for this purpose at any single locality from the appropriations for any one fiscal year.

3. STUDY SCOPE

The study area, as shown on plate 1 (encl 1) is located along the right descending bank of the Mazon River, Section 30, T. 33 N., R. 8 E., Goose Lake Township, Grundy County, Illinois. The erosion site is approximately 7 miles south and east of Morris, Illinois.

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4. DETAIL OF INVESTIGATION

This Detailed Project Report contains sufficient detail to allow approval of the project and initiation of the preparation of plans and specifications.

5. RELATED STUDIES, REPORTS, AND EXISTING WATER PROJECTS

The following study was made previous to this study:

The Flood Insurance Study (FIS) for Grundy County, Illinois,
dated 18, 1985, by Federal Emergency Management Agency.

Information was derived from the above FIS, concerning the Mazon River drainage area, and Hydrologic and Hydraulic Analyses.

6. PROBLEMS AND NEEDS

a. The Grundy County Superintendent of Highways, by letter dated 23 March 1988, requested assistance in behalf of Goose Lake Township, under the authority provided by Section 14 of the 1946 Flood Control Act, as amended, to provide streambank protection to the right downstream bank of the Mazon River at Whitetie Road. County officials are concerned that future flooding on the river will cause road failure.

b. Pursuant to Grundy County's request, representatives of the Rock Island District, Corps of Engineers, made a site visit on 3 March 1988, to investigate the severe erosion and embankment failure along Whitetie Road.

c. Rock Island District informed officials of Grundy County Department of Highways, by letter dated 6 May 1988, that a Section 14 study was being initiated to determine the economic feasibility of providing erosion protection to the riverbank along the Mazon River, parallel to Whitetie Road.

7. EXISTING CONDITIONS

a. The study area extends approximately 600 linear feet along the right descending bank of the Mazon River, paralleling Whitetie Road.

b. The Mazon River generally flows in a northwesterly direction to the Illinois River at Morris, Illinois. It is the main tributary to the Illinois River, in Grundy County, with 455 square miles of drainage area.

c. The eroding bank line measures approximately 40 feet in vertical height above the channel bottom. The lower 6 feet of the bank is comprised of soft grey clay. Above the clay is a layer of yellow-brown sandstone, approximately 20 feet high. The next layer is brown sand and is approximately 12 feet high. The very top layer is sandy topsoil measuring approximately 2 feet thick, with very little vegetation. The river bottom is solid rock, with the channel at the study area being approximately 75 feet wide. The opposite bank is 8 feet high with very sandy soil and is heavily wooded.



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d. It appears the lower grey clay layer of the eroding bank is sloughing, causing the weight of the upper rock/sand bank to slip. Most of the river bank in the study area along Whitetie Road has cracked off, leaving an almost vertical slope, with the top of bank at the edge of the roadway pavement and steel guardrail. Longitudinal tension cracks are appearing along the center line and riverside driving lane of the asphalt surfaced road throughout the study area.

8. FUTURE CONDITIONS WITHOUT PROJECT

Without some type of bank stabilization or protection to control erosion, there is every indication the county road will crack completely and begin to slough off into the river.

The County's Assistant Highway Commissioner informed Corps representatives of an incident not long ago where a similar roadway situation was taking place. There was a significant rainfall one evening and the roadway failed overnight. This could very easily happen at the study area site. The road would then have to be reconstructed at a cost of approximately \$49,000, and the bank would have to be stabilized at an additional cost of \$315,500, for a total of \$364,500.

9. PLANNING OBJECTIVES

a. National Objective. The plan formulation process to accomplish erosion damage reduction is formulated and directed by a national planning objective consistent with protecting the Nation's environment, pursuant to national environmental statutes, applicable executive orders, and other Federal planning requirements.

(1) Water and related land resources project plans should be formulated to alleviate problems and take advantage of opportunities in ways that contribute to this objective.

(2) Contributions to the National Economic Development (NED) are increases in the net value of the national output of goods and services, expressed in monetary units. Contributions to NED are the direct benefits that accrue in the planning area and the rest of the Nation, and include increases in the net value of those goods and services that are marketed, and those that may not be marketed.

b. Specific Objective. To prevent the economic and environmental losses associated with bank erosion and imminent failure of the appurtenances along the Mazon River which parallels Whitetie Road.

10. PLANNING CONSTRAINTS

This study is constrained by all laws of the United States and by the State of Illinois, all executive orders of the President, and all engineering regulations of the Corps of Engineers, including the study authority as

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stated in paragraph 2 of this report.

11. ALTERNATIVES CONSIDERED

The alternatives considered to curtail the erosion problem at the study site included: (1) road relocation, (2) riprap, (3) articulating concrete mat, and (4) no action.

Placing riprap along the bank line is the NED plan and is the alternative chosen to curtail the erosion in the study area.

12. SELECTED PLAN

The study recommends placing riprap along approximately 600 linear feet of the right descending bank of the Mazon River, parallel to Whitetie Road, as shown on plate 2 (encl. 1).

Bank preparation or excavation of the existing bank is not advisable due to the instability/unpredictability of the slope. The riprap will be mass dumped against the existing bank to provide strength and support, to hold up against any further slippage. The fill material on the top slope will provide a good base for reestablishing vegetation, thus providing a natural protection against erosion.

The riprap will be placed up to elevation 530 National Geodetic Vertical Datum (NGVD), and graded to provide a 1 vertical on 1.5 horizontal slope. The remaining upper portion of the bank will be filled and graded with stable earth materials to provide a 1 vertical on 1.5 horizontal slope which will extend from the top of the riprap at elevation 530 NGVD to the existing top of bank elevation ± 546.7 NGVD. The graded earth slope will be seeded with an erosion resistant grass cover. Approximately 268 cubic yards ($\approx .45$ cubic yard/foot) of riprap will be placed below the calculated Ordinary High Water (OHW) elevation of 508.7 NGVD along the project area.

Every effort will be made to comply with U.S. EPA guidelines, for assuring Section 401 Water Quality, during construction.

13. HYDRAULICS ANALYSIS AND RIPRAP DESIGN

a. Flow Analysis. Flow frequency relationships were developed for the Mazon River at the study area near Coal City, Illinois. A USGS gaging station (Station No. 05542000) is located 4.5 miles upstream of the study area. A frequency analysis was performed at the gage using the Hydrologic Engineering Center's computer program "Flood Flow Frequency Analysis." The results of this frequency analysis apply to the erosion site and are shown on plate 3 (encl. 1). Using a normal depth analysis, A bank-full flow of 5,900 cubic feet per second was determined. This flow is slightly less than the 2-year flow. The corresponding velocity for this flow is 8 feet per second.

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b. Bank Protection Alternatives. Two alternatives were investigated to protect the bank, riprap and concrete-filled mattress. Riprap is a commonly used, effective method of bank stabilization, and fabriform is also evaluated since ice has been shown to be a problem at the site. Both will help to control further erosion and the selection of either one should be based on economics.

c. Shear Analysis for Riprap. A riprap layer of 12 inches is the minimum required for riprap placed in the dry, which is the situation at this site. However, slope stability is a severe problem at this site. Based on previous experience, a massive dump of 18-inch-thick riprap placed at the toe of the eroding bank should halt further erosion. Using this thickness and a stone density of 165 pound per cubic foot results in an average stone diameter (D50) of 0.88 foot. The local boundary shear exerted on the riprap due to a bank-full flow for this D50 was calculated to be 0.79 pound per square foot using the following equation:

$$T_o = \frac{GV^{**2}}{(32.6 \log \frac{12.2y}{D50})} **2$$

G = Unit weight of water
V = Velocity = 8 foot per second
D50 = Avg. stone diameter
= 0.88 ft.
y = Flow depth = 11 ft.

Using a non-uniform flow factor of 1.5 the local boundary shear will be $(1.5)(0.79) = 1.2$ pounds per square foot. The riprap design shear for an 18-inch layer at a slope of 1V on 1.5H and a D50 of 0.88 foot was calculated to be 2.20 pounds per square foot using the following equations:

$$T = \frac{\sin c}{2} T(1 - \sin d) 0.5$$

1
T = Side slope design shear
c = Side slope angle (26.6)
d = Angle of repose (34)
T = Channel bottom design shear

$$T = a (G_s - G) D50$$

a = 0.040
D50 = 0.88 ft.
G_s = Unit stone weight (165 pounds per cubic foot)
G = Unit water weight (62.4 pounds per cubic foot)

d. Riprap Design. The required riprap design gradation was determined in accordance with procedures in EM 1110-2-1601 and ETL 1110-2-120. From the proceeding shear analysis, 18-inch-thick riprap should provide adequate protection from future bank erosion as the riprap design shear is greater than the local boundary shear imposed on the bank. The following is the required minimum riprap gradation:

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Percent Lighter by -----Weight-----	Limits of Stone Weight (lb.)
100	292-117
50	86-58
15	43-18

e. Concrete-Filled Mattress Design. The design for the concrete-filled mattress was based on general specifications and recommendations by the manufacturer. The resulting protection should be 6 inches thick. The design is adequate to stabilize the bank for flow velocities up to approximately 15 feet per second.

f. Ordinary High Water Elevations. The ordinary high water elevation corresponds to the 25-percent duration flow. A 25-percent duration flow of 320 cubic feet per second at the Coal City gage was determined from an analysis of mead daily flow records. An elevation corresponding to that flow at the study site was obtained from a normal depth analysis. Therefore, the OHW elevation for the study area is 508.7 NGVD.

14. ENVIRONMENTAL ASSESSMENT:

a. Major Findings And Conclusions. The purpose of this Environmental Assessment is to evaluate the impacts of various measures of protection proposed to prevent Whitetie Road from further eroding into the Mazon River. The alternatives considered include relocation of the road, reshaping and riprapping of the riverbank, placement of an articulating concrete mattress, and no action.

The selected alternative, bank riprapping and reshaping, was chosen over the other alternatives based on economic and environmental considerations. The no action alternative is the least desirable alternative and would only be considered if a cost effective plan could not be developed. The road relocation alternative was not selected since this alternative would neither correct the erosion problem along the river, nor would it alleviate the danger of Whitetie Road sloughing off into the river. In addition, the cost of road relocation makes this alternative economically infeasible. The articulating concrete mattress alternative was not selected since it too is an economically infeasible alternative.

An environmental review of the selected alternative indicates that there would be no significant effects on the environment with any effects being short-term and minor. Thus, an Environmental Impact Statement (EIS) will not be prepared but a 404(b)(1) Evaluation for the project has been prepared (encl 2). The Illinois Environmental Protection Agency has issued Section 401 Certification under the Clean Water Act, by letter dated 14 June 1988 (see encl 3).

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b. Relationship To Environmental Requirements. The proposed action would comply with Federal environmental laws, executive orders and policies, and State and local laws and policies, including the Clean Air Act, as amended; the Clean Water Act, as amended; the Endangered Species Act of 1973, as amended; the Fish and Wildlife Coordination Act of 1958, as amended; the Land and Water Conservation Fund Act of 1966, as amended; the National Historic Preservation Act of 1966, as amended; the Nation Environmental Policy Act of 1969, as amended; Executive Order 11988, Floodplain Management; and Executive Order 11990, Protection of Wetlands. Since the proposed action would not result in the conversion of farmland to nonagricultural uses, the Farmland Protection Policy Act of 1981 does not apply to this project.

c. Environmental Setting. The Mazon River, a secondary tributary in the Upper Mississippi River system, and the main tributary to the Illinois River, flows through the northeastern portion of Illinois. Meandering through Grundy County, the Mazon joins the Illinois River near Morris, Illinois, draining approximately 176,000 acres of mostly cultivated farmland. The land in the vicinity of the proposed project is a combination of woodland, pasture, and agricultural fields.

The following paragraphs describe the existing conditions at the project site:

The Mazon River is a picturesque river flowing through Illinois farm country. In addition to fishing and canoeing, the Mazon is also noted for areas of whitewater kayaking. The National Park Service has determined that the Mazon River is eligible as an inventory river for the National Wild and Scenic Rivers System (under the Wild and Scenic Rivers Act of 1980). Correspondence with the National Park Service has determined that the proposed project will not affect the eligibility of the river for the Wild and Scenic River System, nor will it significantly affect the riparian environment along the banks of the river.

The river channel is approximately 75 feet wide and 3 feet deep at the project site and is comprised of bedrock and stone rubble. The eroding banks of sandstone and soft clay extend about 40 vertical feet above the river. The immediate area within the project location is sparsely vegetated due to efforts by local interests to replace the eroding bank with random fill and gravel. However, the area adjacent to either end of the project is typical of other riparian habitat with silver maple, oak, and sycamore trees common along the reach. The land across the river is a combination of woodland and pasture. Popular game fish in the river include smallmouth bass and channel catfish.

Correspondence with the Fish and Wildlife Service has determined that there will be no impact to federally endangered species, including the Indiana bat (*Myotis sodalis*) and its habitat. However, one species of fish, the big-eye shiner (*Notropis bigeye*), is listed on the Illinois State List of Rare and Endangered Species. The minnow has not been found in the river for many years according to the Illinois Department of Conservation, even

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though the Mazon River is listed as potential habitat for the species.

Siltation and increased turbidity in the water are possible causes for its decline. Impacts to the species are not likely and the completed project may improve the quality of habitat by decreasing the silt load currently being eroded into the river.

d. Environmental Effects. No significant adverse impact would result from construction of the proposed project. As specified by Section 122 of the 1970 Rivers and Harbors Act, potential project impacts on the parameters listed in table 1 of enclosure 2, were considered in arriving at a final determination. In compliance with Section 404 of the Clean Water Act, a 404(b)(1) Evaluation (encl 2) has been prepared.

1. Natural Resources - Slope failure of the right descending bank has resulted in erosion of approximately 600 linear feet of the bank, endangering a portion of Whitetie Road. The proposed protection plan involves placing riprap up to elevation 530.0 NGVD and grading to provide a 1 vertical on 1.5 horizontal slope. The remaining upper portion of the bank will be filled and graded with stable earth materials to provide a 1 vertical on 1.5 horizontal slope which will extend from the top of the riprap to the existing top of bank, elevation +546.7 NGVD. The fill material will be obtained from an existing borrow site approved by the county (see plate 1, encl 1). The riprap shall be of the size and gradation as specified in the riprap design and obtained from a Corps approved source in the vicinity of the project.

Approximately 268 cubic yards (.45 cubic yard/foot) of riprap will be placed below the Ordinary High Water elevation of 508.7 NGVD and may extend out into the channel 23 feet in some places. The top portion of the bank will be seeded as soon as the project is completed. This will reduce the possibility of erosion of the new fill material and help to reestablish plant growth that may be beneficial to wildlife in the future.

Temporary disturbances to local wildlife may occur during the construction phase. However, the existing conditions along the project reach are of little value to wildlife at present and will be substantially worse if the road sloughs off into the river. Some minor loss of benthic organisms may result during construction of the project. However, after placement of riprap is completed, the affected area should be quickly recolonized. Any impacts to the river system during the construction phase of the project will be minor and offset by the ultimate preservation of the roadway and riverbank. The proposed project will reduce erosion of the riverbank, siltation of the channel, and alleviate the possibility of Whitetie Road sloughing off into the river.

Temporary increases in turbidity would occur during project construction, but levels of turbidity will return to preconstruction levels or lower, since sediments will no longer be eroding into the river system.

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In addition, there will be an increase in noise levels and decrease in air quality during the construction phase. However, these are minor impacts and will not permanently affect the area.

2. Cultural Resources - On 18 May 1988, Corps representatives conducted an archaeological reconnaissance survey for the proposed project. A single 19th Century dump site was found in the project area. It was concluded that this site was not eligible for inclusion on the National Register of Historic Places. Coordination of the survey results with the Illinois State Historic Preservation Office (SHPO) was initiated on 21 June 1988. SHPO concurred with our finding, that this site was not eligible for the National Register, on 7 July 1988 (see encl 3).

An existing county borrow site will be used for this project; therefore, an archaeological survey was not conducted at the borrow location.

15. SOCIOECONOMIC ASSESSMENT

a. The socioeconomic impacts associated with providing streambank erosion protection for Whitetie Road in Goose Lake Township, Illinois, would be positive. Community cohesion in the project area would be positively affected; the proposed streambank protection project would provide for the continued use of the roadway, eliminating the need for travelers to use a longer, more time consuming detour route. In addition, the project would require no residential relocations, and would result in no significant impacts to community or regional growth.

b. Services to and from the affected area would be positively impacted by the project. Placement of streambank protection would maintain the shortest access route to the affected area, avoiding additional travel expenses and delays in emergency vehicle response times. Public facilities would benefit from reduced damages from flood-related erosion. The project would eliminate this potential life, health, and safety threat before it necessitated the closing of the roadway. (The roadway would be closed to traffic once bank erosion posed a threat to travelers.)

c. The project would result in no significant impacts on property values or tax revenues. However, without the project, a decrease in property values and related tax revenues could result; the extra travel distance required by a detour route would make affected properties less attractive as a residential or business location.

d. Construction of the project would have no noticeable impact on short-term or permanent employment or labor force in Goose Lake Township. No changes in business and industrial activity during or after construction would be noticed, and no business or farm relocations would be required.

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e. Heavy machinery would generate a temporary increase in noise levels during construction, possibly disturbing nearby residents; however, the project site is located in an area with limited residential or other types of development. No significant long-term noise impacts would result. It should be noted that without the proposed project, traffic related noise levels would increase along the detour route.

16. REAL ESTATE REQUIREMENTS

Real Estate cost estimate for approximately 2.32 acres of ground located north of Whitetie Road, south of Mazon River in Section 14 of Goose Lake Township in Grundy County, State of Illinois, amounts to \$125. There are no structures within the project limits, and no families or businesses will be displaced by the project.

17. ECONOMIC ANALYSIS

a. Purpose. The purpose of this economic analysis is to study the feasibility of providing Federal action to prevent further riverbank erosion from occurring along the Mazon River. The problem area lies along the right descending bank and threatens the destruction of a section of Whitetie Road, Grundy County, Illinois. The analysis evaluates two types of benefits that could result from proposed Federal action: (1) savings in construction costs, and (2) savings in detour costs. These benefits are compared with the costs of providing the proposed Federal action required to eliminate the bank erosion.

b. Description of the Problem. The erosion occurs primarily during high water and flood flows. Without bank stabilization or protection, this section of Whitetie Road would crack, fail, and begin to slough off into the river. Without remedial action, this failure would likely occur in about 1 year. After failure, the road section would need reconstruction landward of its current site. Bank stabilization, even after a failure/reconstruction event, would be a necessity.

c. Results of no Federal Action. The results of the no Federal Action alternative, form the basis for project benefits. Without Federal action, erosion would continue, leading to the eventual failure of the roadway. This event would necessitate the incurrence of costs resulting from future construction and costs associated with detouring around the affected section of Whitetie Road.

d. Construction Costs. Goose Lake Township, Illinois, would incur an estimated cost of \$48,900 for reconstruction of this Whitetie Road section, after a failure event. Also, bank stabilization efforts to protect the reconstructed road section would be a necessary cost for a permanent solution; this cost is estimated to be \$315,500. Both of these construction costs would be sustained about 1 year beyond the base year, based on the historic

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average rate of erosion (1.1 feet per year). To further emphasize the erosion and pending failure situation (and to support the erosion rate used), a recent occurrence can be cited. In March 1988 a two-inch rainfall caused the streambank to erode nearly two feet. The outer edge of the road base is now exposed. Further erosion would likely result in road failure. Therefore, a one-year period prior to failure is a reasonable projection. The benefit derivation for eliminating reconstruction and related costs to Goose Lake Township, Illinois, is illustrated in table 1.

TABLE 1
Construction Benefits
September 1988 Prices, 8-5/8%, 50-Year Life

<u>Item</u>	<u>Cost of Construction</u>	<u>Years to Base Year</u>	<u>Present Worth Factor</u>	<u>Base Year Value</u>
Road Reconstruction	\$ 48,900	1	.92060	\$ 45,020
Bank Stabilization	\$315,500	1	.92060	\$290,450
Total				<u>\$335,470</u>
Annualized at 8-5/8%, 50 years, rounded				\$ 29,400

e. Detour Costs. Benefits would accrue to the proposed project from the savings of detour-related costs. Without Federal action, the roadway would fail and be closed to traffic. Motorists would be forced to use longer, alternative routes for approximately 6 months, until the Township could relocate and reconstruct the failed roadway. Detoured motorists would incur additional costs related to vehicle operation, as well as opportunity costs for additional travel time. Benefits derived from the avoidance of detour-related costs are based on the following:

Average daily traffic for 1988 is estimated to be 400 vehicles, as estimated by Grundy County Superintendent of Highways office (based on traffic data for recent years). Table 2 describes the additional operating costs incurred by detouring vehicles, based on a 3.5-mile detour, normal vehicle configuration and average operating costs.

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TABLE 2

Additional Operating Costs

Vehicle Type	Daily Traffic	6-Months Daily Trips	Detour Miles	Per Mile Costs	Added Operating Costs
Passenger Cars	354	64,605	3.5	.14	\$31,700
Trucks, etc.	46	9,200	3.5	.40	12,900
Total					\$44,600
Annualized at 8-5/8%, 50 years, rounded					\$ 3,900

f. Opportunity Costs. The opportunity cost of time is the value of work or leisure activities forgone due to additional travel time required by the detour route. For passenger cars, the value of time for adults and children was assumed to equal one-third and one-twelfth of the average hourly wage rate, respectively. Morris, Illinois (study area) has a 1988 average wage rate of \$8.73, with 31 percent of the residents being under age 18. Therefore, the opportunity cost of time for passenger cars was assumed to be \$2.23 an hour per occupant ($\$8.73 \times .69 \times 1/3 + \$8.73 \times .31 \times 1/12 = \2.23).

Average car occupancy is 2.1 persons, resulting in \$4.68 per hour opportunity cost. For truck and equipment traffic, an approximate wage rate of \$12.00 per hour was used to estimate opportunity costs, with the assumption of one occupant per vehicle. Table 3 illustrates the benefit derived through opportunity cost savings.

TABLE 3
Opportunity Cost of Time

Vehicle Type	Extra Travel Time (Hours)	6-Months Daily Trips	Hourly Cost of Time	Total Opportunity Cost
Passenger Cars	.09	64,605	\$ 4.68	\$27,300
Trucks, etc.	.09	9,200	\$12.00	\$ 9,900
Total				\$37,200
Annualized at 8-5/8%, 50 years, rounded				\$ 3,300

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g. Road Maintenance. No net change in road maintenance costs would be expected from the 6-month closure of the affected section of Whitetie Road. Increased maintenance on the detour route would be offset by reduced maintenance on the closed road section.

h. Land Loss. Land loss due to erosion of embankment, and road relocation/reconstruction would be minor. Any derived benefits for land loss savings would be negligible.

i. Redevelopment Benefits. Grundy County, Illinois, does not qualify for redevelopment benefits.

j. Cost-of-Recommended-Federal-Action. The recommended Federal action would place riprap along approximately 600 linear feet of the right descending bank of the Mazon River, parallel to Whitetie Road (see plate 2 encl 1). The total first cost of this project is estimated to be \$315,625. Table 4 shows a detailed project cost estimate based on September 1988 prices. Table 5 relates annual costs of this project, computed using an 8-5/8 percent discount rate and a 50-year analysis period. An annual maintenance charge was calculated assuming a 50 percent replacement of riprap 25 years after project construction. No interest during construction was computed due to the short construction period. Table 6 summarizes annual benefits and costs for the each alternative. As indicated, the alternative chosen is economically justified with a benefit-cost ratio of 1.3 and net benefits of \$7,700, and was also preferred by the sponsor.

TABLE 4

Cost Estimate-September 1988 Prices

<u>Item</u>	<u>Quantity</u>	<u>Unit</u>	<u>Unit Cost (\$)</u>	<u>Federal Cost (\$)</u>	<u>Non-Federal Cost (\$)</u>
Fill Material	1,900	C.Y.	5	\$ 9,500	
Riprap	8,716	Tons	25	217,900	
Seeding	.5	Acre	2,000	1,000	
Real Estate					\$ 125
Subtotals				\$228,400	\$ 125
Contingencies (25%)				57,100	
Subtotal				\$285,500	
Engineering and Design				22,000	
Supervision and Administration				8,000	
Subtotals				\$315,500	\$ 125
Non-Federal Cash Requirements				-78,780	+78,780
Subtotals				\$236,720	\$78,905
Project Total				\$315,625	

CENCR-PD-F (1105-2-10b)

SUBJECT: Definite Project Report and Environmental Assessment for Section 14
Emergency Streambank Protection, Mazon River, Whitetie Road, Goose Lake
Township, Grundy County, Illinois (CWIS No. 92345)

TABLE 5

Annual Cost of Recommended Action
September 1988 Prices, 8-5/8%, 50-Year Analysis

<u>Item</u>	<u>First Cost</u>	<u>Annual Cost</u>
Federal	\$236,720	
Non-Federal	78,905	
Total First Cost	<u>\$315,625</u>	\$27,700
Operation and Maintenance (\$217,900 x 1/2 x .1264 x .08765)		1,200
Total Annual Cost		<u>\$28,900</u>

TABLE 6

Summary of Benefits and Costs
September 1988 Prices, 8-5/8%, 50-year Analysis Period

<u>Description</u>	<u>Riprap</u>	<u>Concrete Mat</u>
Project First Cost	\$315,625	\$400,000
Annualized First Cost	27,700	35,100
Annual Operations Cost	1,200	1,000
Total Annual Charges	28,900	36,100
Average Annual Benefits	36,600	36,600
Avoided Non-Federal:		
Construction Costs	(29,400)	(29,400)
Vehicle Operating Costs	(3,900)	(3,900)
Opportunity of Time Costs	(3,300)	(3,300)
Net Benefits	7,700	500
Benefit-to-Cost Ratio	1.3	1.0

k. Alternatives Considered. In addition to riprap protection for the eroding streambank (the recommended plan), protection by concrete-filled mattress was considered. This alternative was more costly than riprap protection. The concrete-filled mattress alternative has an estimated cost of \$400,000. This cost estimate significantly exceeds the cost of riprap protection. Since the benefits are the same regardless of protection method, riprap is the recommended (least cost) method and is also the local sponsor preferred plan.

CENCR-PD-F (1105-2-10b)

SUBJECT: Definite Project Report and Environmental Assessment for Section 14
Emergency Streambank Protection, Mazon River, Whitetie Road, Goose Lake
Township, Grundy County, Illinois (CWIS No. 92345)

18. COST APPORTIONMENT

a. Recent legislation passed by Congress and signed by the President of the United States, requires that all construction of Section 14 projects awarded after 1 October 1986, be cost-shared between the Federal Government and the non-Federal project sponsor. Project cost-sharing is in accordance with Public Law 99-662 of the Water Resources Development Act of 1986 and is designed to provide consistency among projects and programs and equity among sponsors of comparable works.

b. Under these provisions, the non-Federal project sponsor is to provide, without cost to the Government, during the period of construction, all lands, easements, rights-of-way, and dredged material disposal areas, and perform all relocations and alterations of buildings, utilities (except those which pass under or through the line of protection), highways, railroads, bridges (except railroad bridges), sewers, and related and special facilities determined by the Government to be necessary for the construction of the project. To the extent that any of the lands, easements, or rights-of-way provided are already owned as part of the facility or structure being protected, the value of such interests shall not be included in the total project costs, nor credited toward the project sponsor's required project contribution.

If the value of the above allowable contributions represents less than 25 percent of the total project costs, the project sponsor shall provide during the period of construction, an additional cash contribution in the amount necessary to make its total contribution equal to 25 percent of the total project costs. The project sponsor is also required to contribute all project costs in excess of the Federal statutory limitation of \$500,000. The cost apportionment for this project is shown in the following table.

Cost Apportionment Table

Non-Federal Apportionment

25 Percent County Share	\$ 78,905
Less Credit (Lands, Easement, Rights-of-Way, etc.)	125
Cash Payment Required	<u>\$ 78,780</u>

Federal Apportionment

Total Project Costs	\$315,625
Less Non-Federal Share	<u>78,905</u>
Total Federal Cost	\$236,720

CENCR-PD-F (1105-2-10b)

SUBJECT: Definite Project Report and Environmental Assessment for Section 14
Emergency Streambank Protection, Mazon River, Whitetie Road, Goose Lake
Township, Grundy County, Illinois (CWIS No. 92345)

c. Financial Analysis. The Highway Commissioner for Goose Lake Township has indicated that the Township is willing and able to finance its cost-shared portion (\$78,905) of project costs. These funds will be made available from cash balances in the township's road maintenance account. This financial capability has been ascertained through telephone conversations with the Highway Commissioner, and a recent Letter of Assurance, stating authority and capability to participate in this Section 14 project.

d. Ability to Pay. Based on the provisions of Section 103 of Public Law 99-662, Goose Lake Township has the ability to provide its normal share of project costs. The analysis, illustrated in the table below, is based upon the project benefit-to-cost ratio and the project-area per capita income. The township does not qualify for reduced cost sharing.

Ability to Pay Analysis Table

<u>PROJECT:</u>		<u>GOOSE LAKE TOWNSHIP, ILLINOIS</u>	
ANNUAL COST	\$ 27,700		COST & BENEFITS ARE FOR FLOOD CONTROL
ANNUAL BENEFITS	36,600		
TOTAL COST	315,625		
LOCAL SHARE	78,905		
B/C RATIO	1.32		
STATE FACTOR	106.5		SUM OF STATE & COUNTY MUST BE LESS THAN 163.2.
COUNTY FACTOR	111.95		
			SUM IS 218.45
<u>NOT QUALIFIED</u>			
BASE BENEFITS FLOOR	33%		1/4 BENEFIT-COST RATIO
% LOCAL SHARE	25%		
EF	-4.89		ELIGIBILITY FACTOR

NOT QUALIFIED

19. PLAN IMPLEMENTATION

a. Corps of Engineers. This report will be processed for approval of the selected plan of action and the authorization of funding for construction. Upon appropriation of funding by the office of the Chief of Engineers, the Rock Island District will be responsible for the preparation of plans and specifications and the construction of the project.

CENCR-PD-F (1105-2-10b)

SUBJECT: Definite Project Report and Environmental Assessment for Section 14
Emergency Streambank Protection, Mazon River, Whitetie Road, Goose Lake
Township, Grundy County, Illinois (CWIS No. 92345)

b. Coordination. Details of the proposed project have been coordinated with the following Federal, State, and local agencies:

Grundy County, Illinois, Department of Highways
Goose Lake Township, Illinois, Highway Commission
Illinois State Historic Preservation Officer
Illinois Department of Conservation
U.S. Fish and Wildlife Service
Illinois Environmental Protection Agency
National Park Service
Illinois Department of Natural Resources

c. Goose Lake Township, Illinois. In compliance with Section 221 of Public Law 91-611, the Township will, prior to construction of the project, enter into an agreement (Local Cooperation Agreement) with the Government, whereby the Township pledges to act as sponsor for the project and carry out the following responsibilities:

(1) Provide, without cost to the Government, during the period of construction, all lands, easements, rights-of-way, and dredged material disposal areas, and perform all relocations and alterations of buildings, utilities, highways, railroads, bridges (other than railroad bridges), sewers, and related facilities necessary for construction of the project. To the extent that any of the lands, easements, or rights-of-ways provided under this paragraph are already owned as part of the facility or structure being protected, the value of such interests shall not be included in the total project costs nor credited toward the Goose Lake Township, Illinois' required project contribution.

(2) Make a cash payment of not less than 5 percent of the total project costs during the period of construction, regardless of the value of the items in paragraph (1) above. If the value of the allowable contributions provided under paragraph (1) above represents less than 25 percent of the total project costs, the Township shall provide, during the period of construction, an additional cash contribution in the amount necessary to make its total contribution equal to 25 percent of the total project costs.

(3) Contribute all project costs in excess of the Federal statutory limitation of \$500,000.

(4) Hold and save the Government free from all damages arising from the construction, operation, and maintenance of the project, except for damages due to the fault or negligence of the Government or its contractors.

(5) Operate, maintain, replace, and rehabilitate the project upon completion in accordance with regulations or directions prescribed by the Government.

CENCR-PD-F (1105-2-10b)

SUBJECT: Definite Project Report and Environmental Assessment for Section 14
Emergency Streambank Protection, Mazon River, Whitetie Road, Goose Lake
Township, Grundy County, Illinois (CWIS No. 92345)

(6) Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, approved 2 January 1971, in acquiring lands, easements, and rights-of-way for construction and subsequent operation and maintenance of the project, and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

(7) Comply with Section 601 of Title VI of the Civil Rights Act of 1964 (Public Law 88-352), and Department of Defense Directive 5500.11, issued pursuant thereto and published in Part 300 of Title 32, Code of Federal Regulations, as well as Army Regulation 600-7, entitled: "Non-Discrimination on the Basis of Handicap and Programs and Activities Assisted or Conducted by the Department of the Army."

(8) Grant the Government a right to enter, at reasonable times and in a reasonable manner, upon land which the Township owns, or controls, for access to the project, or for the purpose of inspection and, if necessary, for the purpose of completing, operating, repairing, maintaining and rehabilitating the project. If an inspection shows that the Township, for any reason, is failing to complete, operate, repair, maintain or rehabilitate the project in accordance with the assurances hereunder, the Government will send a written notice to the Township. If the Township persists in such failure for 30 calendar days after receipt of the notice, then the Government shall have a right to enter, at reasonable times and in a reasonable manner, upon land that the Township owns, or controls, for access to the project for the purpose of completing, operating, repairing, maintaining, and rehabilitating the project. No completion, operation, repair, maintenance, or rehabilitation by the Government shall operate to relieve the Township of responsibility to meet its obligations as set forth in the Agreement, or to preclude the Government from pursuing any other remedy at law or equity to assure the faithful performance pursuant to the Agreement.

The Township is willing and able to pay its share of the total project costs. Sufficient funds are on hand or can be raised quickly, and the cash payment can be deposited directly with the Government, or in an escrow account, upon demand by the Government.

The estimated total non-Federal share consists of a cash contribution of \$78,905. It is anticipated that the Township will have to invest \$1,200 annually to replace lost riprap during the 50-year project life.

CENCR-PD-F (1105-2-10b)

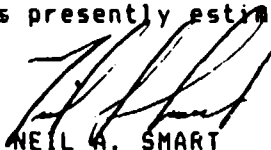
SUBJECT: Definite Project Report and Environmental Assessment for Section 14
Emergency Streambank Protection, Mazon River, Whitetie Road, Goose Lake
Township, Grundy County, Illinois (CWIS No. 92345)

20. RECOMMENDATION

I recommend that the plan selected herein to provide riprap on approximately 600 linear feet of eroding bank line and protect Goose Lake Township's Whitetie Road, which runs parallel to the right descending bank of the Mazon River, Grundy County, Illinois, be authorized for implementation as a Federal project with a total cost to the United States presently estimated at \$236,720.

4 Encls

1. Plates
2. Section 404(b)(1)
3. Pertinent Correspondence
4. Distribution List


NEIL A. SMART
Colonel, EN
Commanding

FINDING OF NO SIGNIFICANT IMPACT

In accordance with the National Environmental Policy Act, the Rock Island District, Corps of Engineers, has assessed the environmental impacts of the following project:

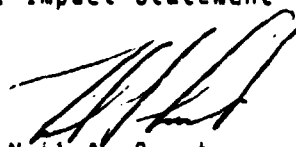
SECTION 14 EMERGENCY STREAMBANK PROTECTION
AND ENVIRONMENTAL ASSESSMENT
MAZON RIVER, WHITETIE ROAD
GOOSE LAKE TOWNSHIP
GRUNDY COUNTY, ILLINOIS

The intent of this project is to provide emergency bank protection along the right descending bank of the Mazon River, paralleling Whitetie Road. The proposed project would prevent further deterioration of the existing bank and alleviate the danger of Whitetie Road sloughing off into the river. The project involves reconstruction and riprapping of approximately 600 linear feet of the bank of the Mazon River. This finding of no significant impact is based on the following factors: the project would have minor and short-term impacts on fish and wildlife resources and on water quality; the project would have minor impacts on the social environment; the project would have no impact on the cultural environment; and continued coordination will be maintained with appropriate State and Federal agencies.

The environmental review process indicates that the proposed action does not constitute major Federal action significantly affecting the environment. Therefore, preparation of an Environmental Impact Statement (EIS) is not warranted by later developments.

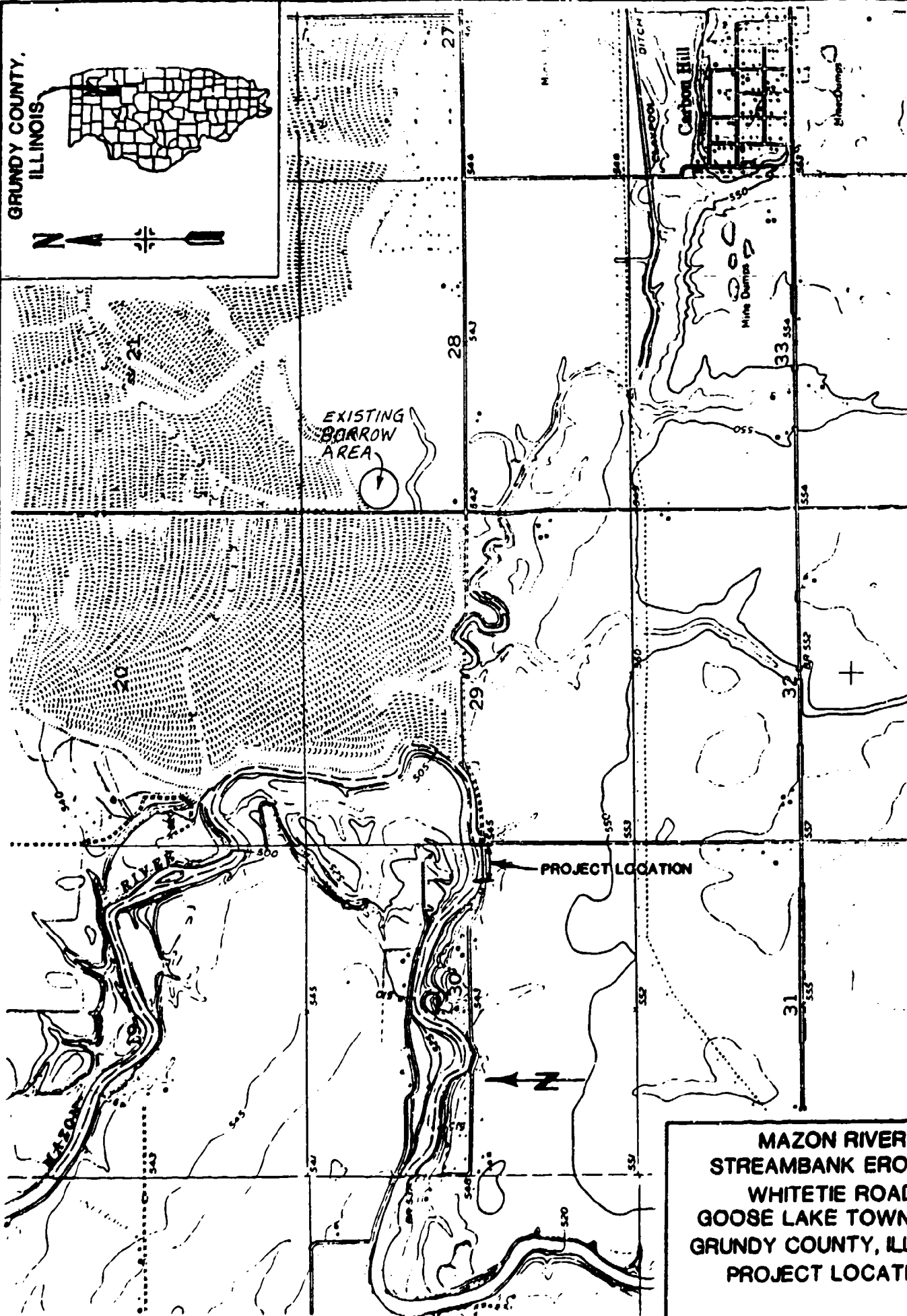
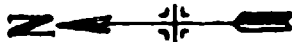
17 Aug 88

(date)


Neil A. Smart
Colonel, U.S. Army
District Engineer

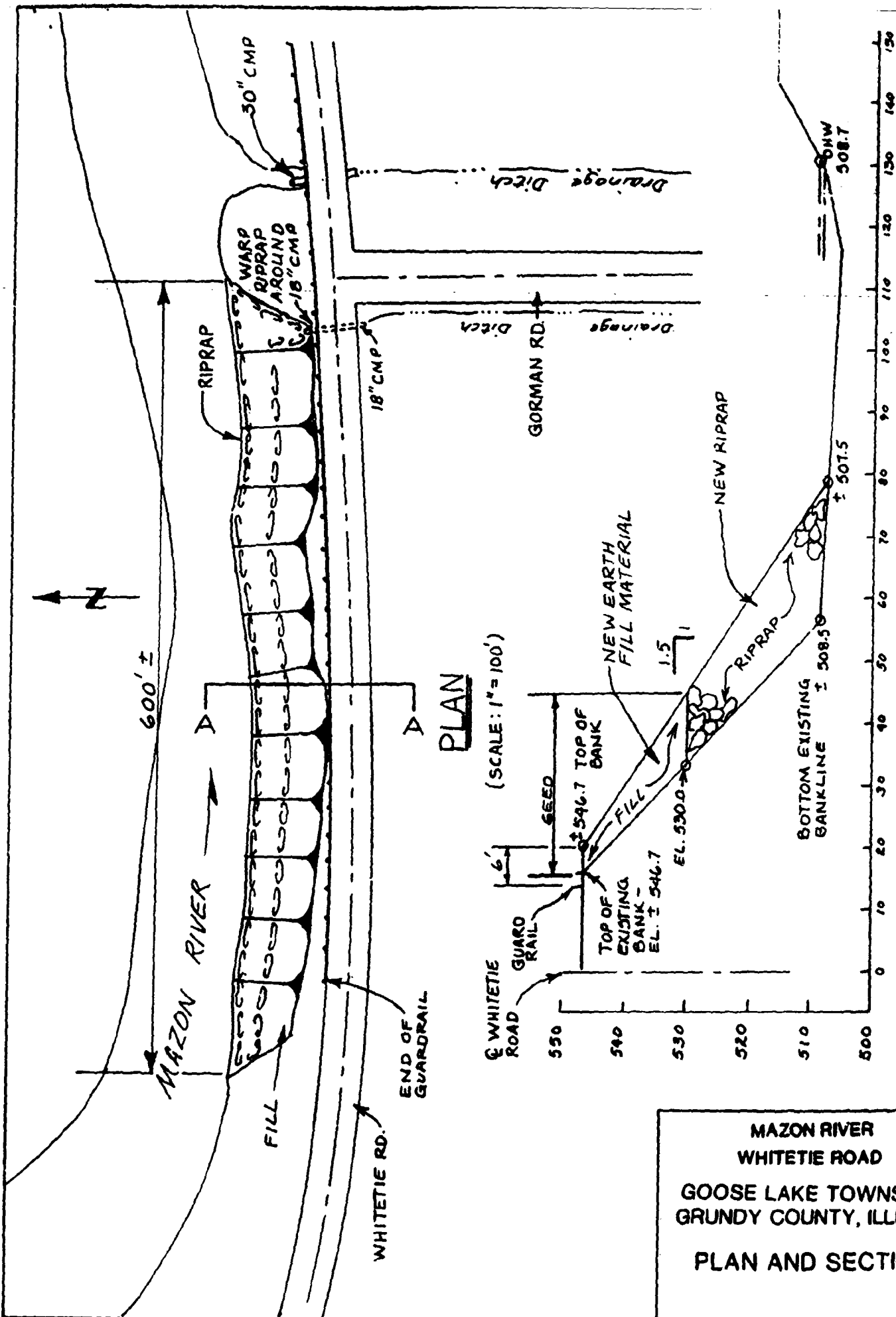
PLATES

GRUNDY COUNTY,
ILLINOIS

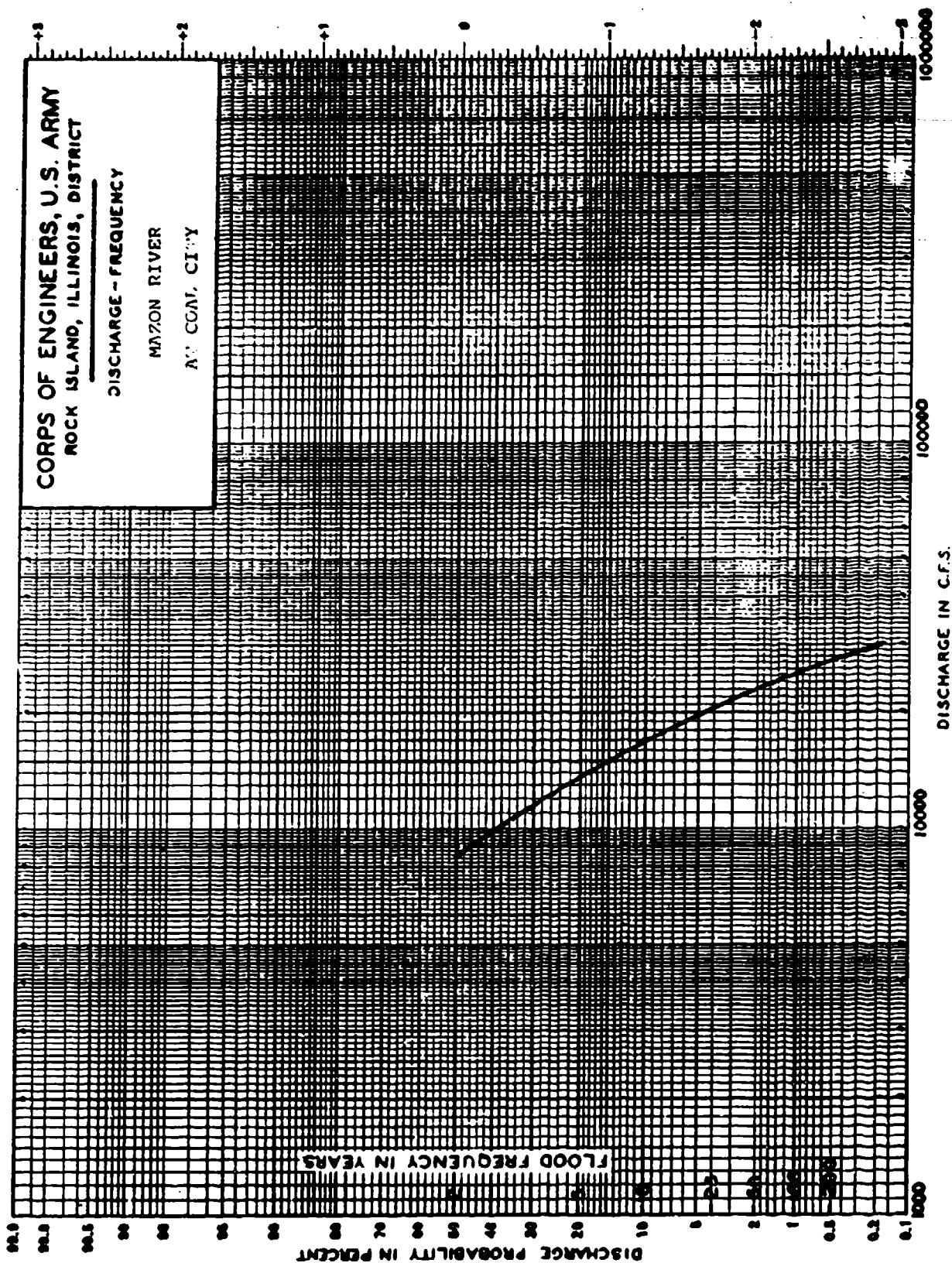


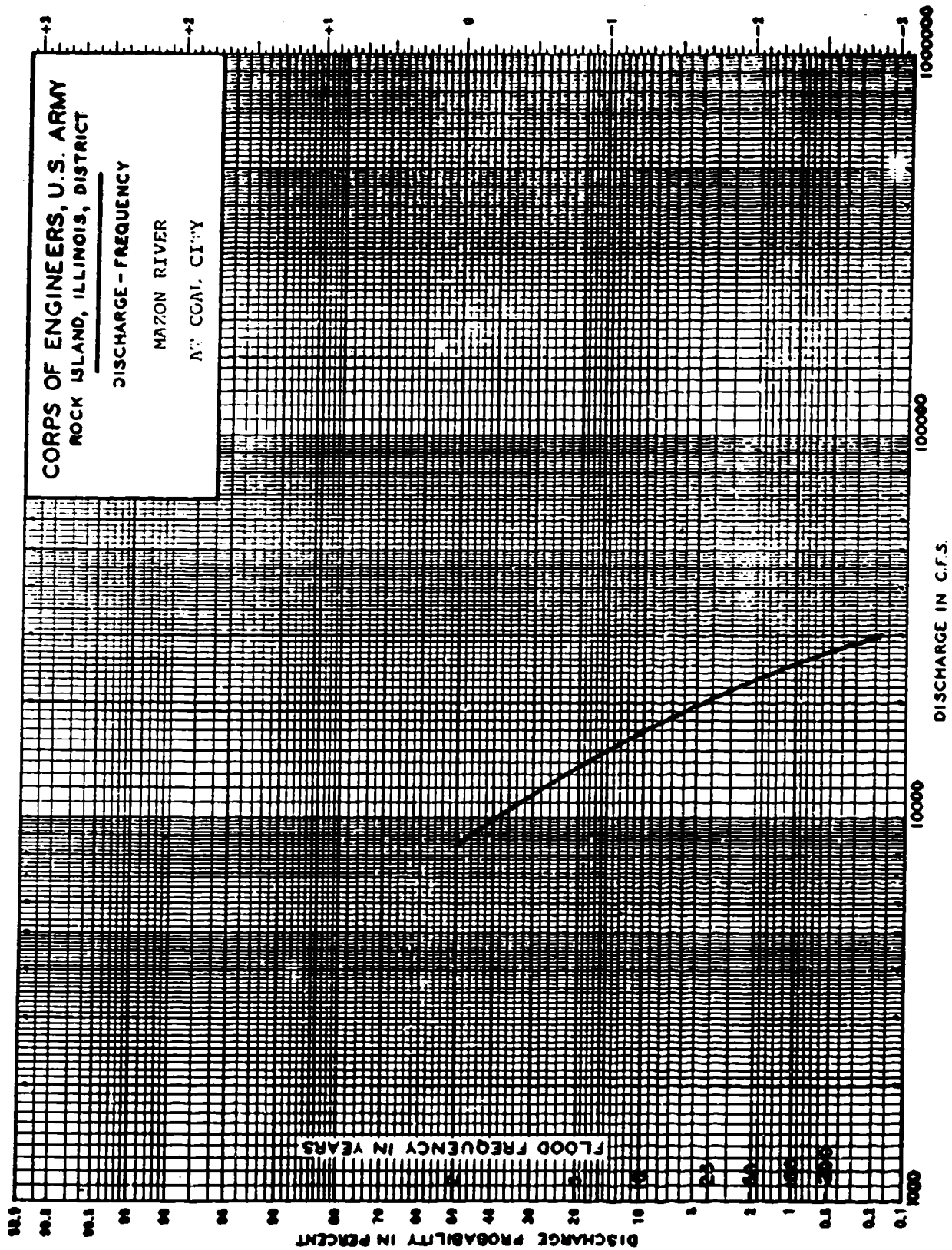
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SCALE IN MILES

**MAZON RIVER
STREAMBANK EROSION
WHITIE ROAD
GOOSE LAKE TOWNSHIP
GRUNDY COUNTY, ILLINOIS
PROJECT LOCATION**



MAZON RIVER
WHITETIE ROAD
GOOSE LAKE TOWNSHIP
GRUNDY COUNTY, ILLINOIS
PLAN AND SECTION





SECTION 404(b)(1) EVALUATION

DEFINITE PROJECT REPORT
AND ENVIRONMENTAL ASSESSMENT
FOR
SECTION 14 EMERGENCY STREAMBANK PROTECTION
HAZON RIVER, WHITETIE ROAD, GOOSE LAKE TOWNSHIP
BRUNDY COUNTY, ILLINOIS

CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION

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SECTION 3 - FINDINGS OF COMPLIANCE OR NONCOMPLIANCE
WITH THE RESTRICTIONS ON DISCHARGE

List of Tables

<u>Table No.</u>	<u>TITLE</u>
1	Environmental Impact Assessment Matrix

**DEFINITE PROJECT REPORT
AND ENVIRONMENTAL ASSESSMENT
FOR
SECTION 14 EMERGENCY STREAMBANK PROTECTION
MAZON RIVER, WHITETIE ROAD
GOOSE LAKE TOWNSHIP, GRUNDY COUNTY, ILLINOIS
CLEAN WATER ACT
SECTION 404(b)(1) EVALUATION**

SECTION 1 - PROJECT DESCRIPTION

LOCATION

The proposed erosion control project is located along approximately 600 linear feet of bank on the Mazon River, paralleling Whitetie Road in Goose Lake Township, Grundy County, Illinois. The site is 7 miles south and east of Morris, Illinois (see Plate 1, encl. 1 of Detailed Project Report).

GENERAL DESCRIPTION

Erosion of the right descending bank of the Mazon River is endangering a portion of Whitetie Road. Slope failure has resulted in erosion of approximately 600 linear feet of the bank adjacent to the road. Local interests have attempted to control erosion by dumping 2-inch stone on the slope but because of the steep existing slope, their attempt has proven to be useless. The proposed protection plan involves installing riprap along approximately 600 linear feet up to elevation 530.0 NGVD on a 1V on 1.5H slope, and placing fill material from elevation 530 NGVD up to top of bank elevation 546.7 NGVD, then grading and shaping it to provide a 1V on 1.5H slope. This upper slope and any other areas disturbed by the construction, will be seeded to provide a natural erosion protection.

AUTHORITY AND PURPOSE

This study is authorized by Section 14 of the 1946 Flood Control Act, as amended. The purpose is to stabilize the eroding bank and prevent damage and/or loss of Whitetie Road.

GENERAL DESCRIPTION OF DREDGED AND FILL MATERIAL

GENERAL CHARACTERISTICS OF THE MATERIAL

The riprap will be clean quarry run rock (see paragraph 13d of Detailed Project Report for further information). Fill material will be placed on top of the slope (down to the riprap) to restore the original slope and road shoulder.

QUANTITY OF MATERIAL

- a. Riprap: 8,716 tons
- b. Fill material: 1,900 cubic yards

SOURCE OF MATERIAL

The riprap fill will be obtained from a Corps approved source in the vicinity of the project. Fill material will be obtained from an existing borrow site approved by the county, see Plate 1, encl 1.

DESCRIPTION OF THE PROPOSED DISCHARGE SITES

LOCATION

The placement of fill will be along approximately 600 linear feet of the right descending bank of the river, adjacent to Whitetie Road. Placement of riprap will extend up to elevation 530 National Geodetic Vertical Datum (NGVD) with fill material placed above of the riprap up to elevation 546.7 NGVD. Along the project reach, approximately 268 cubic yards (.45 cubic yards/foot) of riprap will be placed below the Ordinary High Water elevation of 508.7 NGVD.

SITE DESCRIPTION

The river channel is approximately 75 feet wide and 3 feet deep at the project site. The eroding bank line extends about 40 vertical feet above the river, and portions of Whitetie Road are already exposed from the current erosion.

TYPES OF HABITAT

Due to efforts by local interests to replace the eroding bank with random fill and gravel, the immediate area within the project location is sparsely vegetated. The area adjacent to either end of the project is typical of other riparian habitat. Silver maple, oak and sycamore trees were common along the reach. Across the river the area is a combination of woodland and pasture. Popular game fish in the river include smallmouth bass and channel catfish.

One species of fish, the big-eye shiner (Notropis boops), is listed on the Illinois State List of Rare and Endangered Species. Siltation and increased turbidity in the water are possible causes for its decline. The minnow has not been found in the river for many years according to the Illinois Department of Conservation, even though the Mazon River is listed as potential habitat for the species. Therefore, impacts to the species are unlikely, and the overall project may improve the habitat conditions by decreasing the silt load in the river.

TIMING AND DURATION

Construction will be initiated as soon as possible to alleviate the emergency. The project will take about 1 month to complete and should be finished by Fall of 1989.

DESCRIPTION OF DISPOSAL METHOD

A backhoe will probably be used to reshape the bank and move the riprap into place. The backhoe operator should be able to reach down from the top of the bank to reshape the upper portion, but will probably have to position the backhoe in the river to work on the lower part of the bank. Riprap may extend 23 feet out into the river in places along the approximately 600 foot reach of the project. A small bulldozer or grader will be used to regrade the fill placed on the top portion of the bank and to restore the roadway shoulder along Whitetie Road.

SECTION 2 - FACTUAL DETERMINATIONS

PHYSICAL SUBSTRATE DETERMINATIONS

SUBSTRATE ELEVATION AND SLOPES

The proposed action would alter the slope of the embankment from 1 vertical (V) on a horizontal (H) to 1V on 1.5H. The top of the bank will be reshaped

to match the existing elevation of 546.7 NGVD.

SEDIMENT TYPE

The river channel along the reach of the project is comprised of bedrock and rubble with banks of sandstone, soft clay, and brown sands. This area will be replaced by the proposed fill and riprap.

DREDGED/FILL MATERIAL MOVEMENT

No movement of fill material is expected to take place. Some minor runoff may occur if a storm occurs during construction.

PHYSICAL EFFECTS ON BENTHOS

Some benthic organisms will be covered by the riprap fill placed in the channel. Others may be disturbed by the backhoe operating in the channel during construction. Riprap fill may increase the benthic habitat, with new species rapidly re-colonizing the area.

ACTIONS TAKEN TO MINIMIZE IMPACTS

The Mazon River is listed as an Inventory River for the National Wild and Scenic Rivers System. Any impacts to the river during the construction phase of the project will be minor and offset by the ultimate preservation of the roadway and river bank. The proposed project will reduce erosion of the river bank and siltation of the channel, and alleviate the possibility of Whitetie Road sloughing off into the river.

WATER CIRCULATION, FLUCTUATION, AND SALINITY DETERMINATIONS

WATER

The proposed action would not affect water quality. It would not change the existing salinity condition, water chemistry, clarity, color, odor, taste, temperature, dissolved gas levels, nutrient levels or eutrophication potential.

CURRENT PATTERNS AND CIRCULATION

Current Patterns and Flow

Placement of riprap will not appreciably alter current or flow patterns. The project will restore the pre-erosion bank configuration using riprap and fill material.

Velocity

The main channel velocities would not be appreciably altered.

Stratification

The riprap fill will have no effect on the development of stratified conditions in the river.

Hydrologic Regime

The proposed project would not affect the hydrologic regime of the project area.

NORMAL WATER LEVEL FLUCTUATION

The proposed project would not affect water-level fluctuation.

SALINITY GRADIENTS

Not applicable.

ACTIONS TAKEN TO MINIMIZE IMPACTS

Since the project impacts would be minor, measures to minimize impacts are not feasible.

SUSPENDED PARTICULATE/TURBIDITY DETERMINATIONS

EXPECTED CHANGES IN SUSPENDED PARTICULATES AND TURBIDITY LEVELS

Temporary increases in turbidity would occur during project construction, but levels of turbidity will return to pre-construction levels or lower since sediments will no longer be eroding into the river system.

EFFECTS ON CHEMICAL AND PHYSICAL PROPERTIES OF THE WATER COLUMN

No effects are expected on light penetration, dissolved oxygen, toxic metals and organics, pathogens or the aesthetics of the water column during construction or after the project is in place.

EFFECTS ON BIOTA

Effects to the biota would be minimal. Some minor loss of benthic organisms could result during construction of the project. However, the affected area should be quickly re-colonized.

ACTIONS TAKEN TO MINIMIZE IMPACTS

The top portion of the bank will be seeded as soon as the project is completed. This will reduce the possibility of erosion of the new fill material and help to re-establish plant growth along the project reach.

CONTAMINANT DETERMINATIONS

AQUATIC ECOSYSTEM AND ORGANISM DETERMINATIONS

No contaminants will be introduced into the aquatic system since the fill material would be clean quarried rock and fill. Neither the fill nor its placement will cause relocation or increases of contaminants in the aquatic system.

EFFECTS ON PLANKTON AND NEKTON

No effect expected.

EFFECTS ON BENTHOS

Some minor loss of benthic organisms may result.

EFFECTS ON AQUATIC FOOD WEB

No significant or long-term effects on the aquatic food web are expected.

EFFECTS ON SPECIAL AQUATIC SITES

No special aquatic sites are located within the project reach.

THREATENED AND ENDANGERED SPECIES

The proposed action will have no impact on Federal or State threatened or endangered species. Correspondence with the Illinois Department of Conservation has determined that there will be no impact to the big-eye shiner, listed

as endangered, by implementation of the project (see encl. 3 of Detailed Project Report). The quality of habitat in the project location may actually increase by riprapping the river bank and reducing the silt load currently eroding into the river.

OTHER WILDLIFE

Some temporary disturbances of local wildlife may occur during the construction phase. However, the existing conditions along the project reach are of little value to wildlife at present. Reshaping and seeding of the area should stabilize the bank and promote vegetative growth that will be beneficial to wildlife in the future.

ACTIONS TAKEN TO MINIMIZE IMPACTS

The project will use only enough fill material to stabilize the bank. The top portion of the bank will be reshaped and seeded as soon as the project is completed to facilitate plant growth and help hold the fill in place.

PROPOSED DISPOSAL SITE DETERMINATIONS

MIXING ZONE DETERMINATION

Not applicable since the material will not be dispersed.

DETERMINATION OF COMPLIANCE WITH APPLICABLE WATER QUALITY STANDARDS

The fill material will be obtained from approved existing borrow sites while the riprap will be obtained from an approved quarry site near the project area. This will ensure that State water quality standards will not be violated because of project-related activities.

POTENTIAL EFFECTS ON HUMAN USE CHARACTERISTICS

The proposed project will have no adverse effects on municipal or private water supplies; recreational or commercial fisheries; or water-related recreation, aesthetics, parks, national historic monuments, or similar preserves. Implementation of the project may increase fisheries habitat through the placement of riprap, increasing the overall water quality by reducing sediment deposition in the channel.

DETERMINATION OF CUMULATIVE EFFECTS ON THE AQUATIC ECOSYSTEM

Implementation of the project will cause no significant cumulative impact to the aquatic ecosystem.

DETERMINATION OF THE SECONDARY EFFECTS ON THE AQUATIC ECOSYSTEM

No significant secondary effects are expected.

**SECTION 3 - FINDINGS OF COMPLIANCE WITH THE
RESTRICTIONS ON DISCHARGE**

1. No significant adaptations of the guidelines were made relating to this evaluation.
2. Alternatives which were considered in addition to the proposed action were as follows:
 - a. No Federal Action
 - b. Road Replacement
 - c. Placement of Riprap
 - d. Articulating Concrete Mattress
3. Certification under Section 401 of the Clean Water Act has been obtained from the Illinois Environmental Protection Agency by letter dated June 14, 1988. The project will thus be in compliance with the water quality requirements of the State of Illinois.
4. The project would not introduce toxic substances into nearby waters or result in appreciable increases in existing levels of toxic materials.
5. No significant impact to federally listed endangered species will result from this project. This determination is supported by correspondence with the U.S. Fish and Wildlife Service on May 9, 1988.
6. The project is located along a freshwater inland river system. No marine sanctuaries are involved or would be affected.
7. No municipal or private water supplies would be affected. There will be no adverse impact to recreational fishing and no unique or special aquatic sites are located in the project location. No long-term adverse changes to the ecology of the river system will result from this action.
8. Project construction materials will be chemically and physically stable. No contamination of the river is anticipated.
9. The placement of construction material into the water is necessary to stabilize the bank of the Mazon River and prevent failure of Whitetie Road. No other practical alternatives have been identified. The proposed project is in compliance with the guidelines for Section 404(b)(1) of the Clean Water Act, as amended.
10. The proposed project will not significantly impact water quality or the integrity of the aquatic ecosystem.

17 Aug 88

(date)

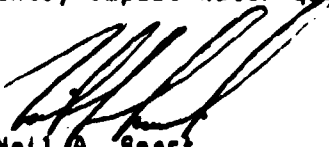

Neil A. Smart
Colonel, U.S. Army
District Engineer

TABLE 1

Environmental Impact Assessment Matrix

Environmental Impact Assessment Matrix						
Name of Parameter	Increasing Beneficial Impact			Magnitude of Probable Impact		
	Significant	Substantial	Minor	No Appreciable Effect	Minor	Increasing Adverse Impact Substantial Significant
A. Social Effects						
1. Noise Levels				X		
2. Aesthetic Values				X		
3. Recreational Opportunities				X		
4. Transportation	X					
5. Public Health and Safety			X			
6. Community Cohesion (Sense of Unity)			X			
7. Community Growth and Development			X			
8. Business and Home Relocations				X		
9. Existing/Potential Land Use				X		
10. Controversy				X		
B. Economic Effects						
1. Property Values				X		
2. Tax Revenues				X		
3. Public Facilities and Services		X				
4. Regional Growth						
5. Employment				X		
6. Business Activity				X		
7. Farmland/Food Supply				X		
8. Commercial Navigation				X		
9. Flooding Effects				X		
10. Energy Needs and Resources				X		
C. Natural Resource Effects						
1. Air Quality				X		
2. Terrestrial Habitat				X		
3. Wetlands				X		
4. Aquatic Habitat			X			
5. Habitat Diversity and Interspersion			X			
6. Biological Productivity				X		
7. Surface Water Quality				X		
8. Water Supply				X		
9. Groundwater				X		
10. Soils				X		
11. Threatened and Endangered Species				X		
D. Cultural Effects				X		
1. Historic Architectural Values				X		
2. Prehistoric and Historic Archeological Values				X		

PERTINENT CORRESPONDENCE

OFFICE OF
RICHARD E. McTAGUE
COUNTY SUPERINTENDENT OF HIGHWAYS
GRUNDY COUNTY
310 E. DUPONT ROAD
MORRIS, ILLINOIS 60450

March 23, 1988

District Engineer
U.S. Army Engineer District,
Rock Island
ATTENTION: Planning Division
Clock Tower Bldg - P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Sir:

In accordance with the provisions of Section 14 of the Flood Control Act of 1948, as amended, which authorizes the federal government to initiate investigations and studies to be made in the interest of emergency streambank and shoreline protection, Goose Lake Township through the County of Grundy hereby makes formal application for a study of the Mazon River along the Whitetie Road in Sections 29 and 30, Township 33 North, Range 8 East of the 3rd Principal Meridian, Goose Lake Township, Grundy County, Illinois.

Goose Lake Township through the County of Grundy can provide the following local cooperation and participation:

1. Provide without cost to the United States all necessary land, easements and rights-of-way, access routes and relocation of utilities necessary for project construction and subsequent operation and maintenance.
2. Hold and save the United States free from claims for damages which may result from construction and subsequent maintenance of the project, except damages due to the fault or negligence of the United States or its contractors.
3. Assume full responsibility for all project costs in excess of the federal cost limitation of \$500,000.
4. Assure maintenance and repair during the useful life of the works as required to serve the project's intended purpose.
5. Provide a minimum cash contribution of 5 percent of the project cost.

District Engineer
U.S. Army Engr Dist, Rock Island

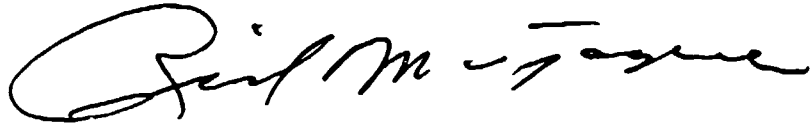
-2-

March 23, 1988

6. If the value of the sponsor's contribution above does not exceed 25 percent of the project cost, provide a cash contribution to make the sponsor's total contributions equal 25 percent.

Feel free to contact this office if you have any questions. Our phone number is (815) 942-0363.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Richard E. McTague".

Richard E. McTague

JEF:mak

cc: Mr. Bruce Trotter

CONVERSATION RECORD

: TIME

: DATE

: May 9, 1988

TYPE [X] VIST [] CONFERENCE [] TELEPHONE [] INCOMING : ROUTING
[] OUTGOING :

NAME OF PERSON(S) CONTACTED : ORGANIZATION : TELEPHONE NO. : NAME : INT
Gerry Bade : FWS : (309) 793-5800 : :

SUBJECT

Mazon River Section 14

SUMMARY: As part of the coordination process under the Fish and Wildlife Coordination Act, I visted with Gerry to inform him of the proposed project on the Mazon River. After reviewing the project plans, Gerry felt that his agency would have no objection to placing riprap along the bank of the Mazon to help prevent further erosion. In addition to stabilizing the bank to keep the road from eroding into the river, the riprap would reduce the amount of sediment washing into the river and help to decrease the degree of turbidity now present. The riprap may provide some beneficial habitat for fish species in the river.

Gerry also mentioned that the Indiana bat (*myotis sodalis*) is a Federally Endangered Species listed for the area but he indicated that this project would have no effect on this species. This telecon will also fulfill the necessary coordination under the Endangered Species Act (16 U.S.C. 1531, Et seq.)

ACTION REQUIRED:

NAME OF PERSON DOCUMENTING CONVERSATION : SIGNATURE : DATE
Joe Slater : *[Signature]* : 5-9-88

ACTION TAKEN

SIGNATURE : TITLE : DATE

50271-101

*U.S. G.P.O. 1985-485-494

CONVERSATION RECORD : TIME : DATE
: : May 13, 1988
TYPE [] VIST [] CONFERENCE [X] TELEPHONE [] INCOMING : ROUTING
[X] OUTGOING :

NAME OF PERSON(s) CONTACTED : ORGANIZATION : TELEPHONE NO. : NAME : INT
Bob Schanzel : IL. Doc : (217)785-4863 : :
SUBJECT : :
Mazon River Section 14 : :

SUMMARY:

I spoke with Bob about his agency's concern with
riprapping the section of Mazon River bank along Whitetie
county road in Grundy Co. IL. I mentioned to Bob that I had found
the Big eye shiner (*Notropis boops*) on one of the Illinois
Department of Conservation's endangered species lists.

Bob felt that his agency would have no problem with implementing
the project and that no impact to the shiner should occur since the
minnow has not been found in the Mazon River for many years. Bob did
indicate that his agency would rather not have riprap fill placed in the
channel, unless it is the only feasible alternative to the problem. His
organization did concur with the fact that the riprap would create some
fish habitat and decrease the silt load in the river. This telecon fulfills
the necessary coordination with his agency under the Fish and Wildlife
Coordination Act.

ACTION REQUIRED:

NAME OF PERSON DOCUMENTING CONVERSATION : SIGNATURE : DATE
Joe Slater :  : 5-13-88

ACTION TAKEN

SIGNATURE : TITLE : DATE

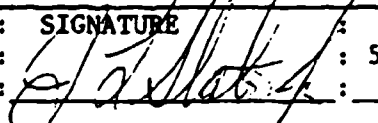
50271-101

*U.S. G.P.O. 1985-485-494

CONVERSATION RECORD		: TIME	: DATE
		:	: May 13, 1988
		:	:
TYPE	[] VIST [] CONFERENCE [X] TELEPHONE	[] INCOMING [X] OUTGOING	: ROUTING
			: NAME : INT
NAME OF PERSON(S) CONTACTED : ORGANIZATION : TELEPHONE NO.			
Bob Schanzel : IL. Doc : (217)785-4863			
SUBJECT			
Mazon River Section 14			
SUMMARY:			
I spoke with Bob about his agency's concern with			
riprapping the section of Mazon River bank along Whitetie			
county road in Grundy Co. IL. I mentioned to Bob that I had found			
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Department of Conservation's endangered species lists.			

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ACTION REQUIRED:

NAME OF PERSON DOCUMENTING CONVERSATION	: SIGNATURE	: DATE
Joe Slater	: 	: 5-13-88
	:	:

ACTION TAKEN

SIGNATURE	: TITLE	: DATE
	:	:
	:	:

50271-101

*U.S. G.P.O. 1985-485-494

CONVERSATION RECORD

: TIME

: DATE

: May 13, 1988

TYPE [] VIST [] CONFERENCE [X] TELEPHONE [] INCOMING : ROUTING
[X] OUTGOING :
: NAME : INT

NAME OF PERSON(S) CONTACTED : ORGANIZATION : TELEPHONE NO.
Ms. Jennifer Brown : IL. EPA : (312)886-6873

SUBJECT
Mazon River Section 14

SUMMARY:

Under coordination requirements of the Fish and Wildlife :
Coordination Act, I contacted Jennifer to explain the proposed
project on the Mazon river. After presenting the details of the project
and associated impacts, I requested her agency's input on the project.

Ms. Brown felt that she would be able to better respond to the impacts
of the project if she could review the draft EA and comment officially at
that time.

ACTION REQUIRED:

Provide draft EA for review and comment.

NAME OF PERSON DOCUMENTING CONVERSATION : SIGNATURE : DATE
Joe Slater : *E. J. Slater* : 5-13-88

ACTION TAKEN

SIGNATURE : TITLE : DATE

50271-101

*U.S. G.P.O. 1985-485-494

June 2, 1988

As part of coordination under the Fish and Wildlife Coordination Act, I notified Tom of the proposed project on the Mazon River. He indicated that since the Mazon River is on the inventory list for Wild and Scenic Rivers, measures should be taken to preserve the area in as natural a state as possible while resolving the erosion problem. He proposed use of the Palmiter method (using cut trees banded together and placed at the water's edge) to encourage sediment deposition in the eroded area. I informed him of the gravel bed in the Mazon and indicated that there was not enough sediment load to replace what was missing along the bank. However, I indicated that the riprap would be only enough to complete the project and that the upper half of the bank would be filled with dirt and seeded. His primary concern was to feasibly try and maintain the integrity of the river.

*U. S. C. P. O. 1985-485-494

LETTER OF ASSURANCE

*Rec'd 3 June 88
slm*

Colonel Neil A. Smart
District Engineer
U.S. Army Engineer District,
Rock Island
Clock Tower Building, P.O. Box 2004
Rock Island, Illinois 61204-2004

Dear Colonel Smart:

The Goose Lake Township, Grundy County, has reviewed the draft of the proposed Local Cooperation Agreement covering streambank erosion control on the Mazon River, at Whitetie Road. The Agreement includes the following obligations to be carried out by Goose Lake Township, Grundy County.

- a. Provide, without cost to the Government, during the period of construction, all lands, easements, right-of-way, and dredged material disposal areas, and perform all relocations and alteration of buildings, utilities, highways, railroads, bridges (except railroad bridges), sewers, and related and special facilities determined by the Government to be necessary for construction of the project.
- b. Make a cash payment of not less than 5 percent of total project costs during the period of construction, regardless of the value of the items in a. above. If the value of the items in a. above is less than 20 percent of total project costs, Goose Lake Township, Grundy County shall, during the period of construction, make such additional cash payments as are necessary to bring its total contribution in cash and value of lands, easements, rights-of-way, and utility and facility alterations and relocations, to an amount equal to 25 percent of total project costs.
- c. Pay all project costs in excess of the Federal statutory limitation of \$500,000.
- d. Hold and save the Government free from all damages arising from the construction, operation, and maintenance of the project, except for damages due to the fault or negligence of the Government or its contractors.

e. Operate, maintain, replace, and rehabilitate the project or functional element thereof upon completion in accordance with regulations or directions prescribed by the Government.

f. Comply with the applicable provisions of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, Public Law 91-646, approved January 2, 1971, in acquiring lands, easements, and rights-of-way for construction and subsequent operation and maintenance of the project, and inform all affected persons of applicable benefits, policies, and procedures in connection with said Act.

g. Comply with Section 601 of Title VI of the Civil Rights Act of 1964 (Public Law 88-352) and Department of Defense Directive 5500.11 issued pursuant thereto and published in Part 300 of Title 32, Code of Federal Regulations, as well as Army Regulation 600-7, entitled "Non-Discrimination on Basis of Handicap and Programs and Activities Assisted or Conducted by the Department of the Army."

h. Participate in and comply with applicable Federal flood plain management and flood insurance programs.

i. Prior to construction, and in accordance with the provisions of Section 221 of Public Law 91-611, Goose Lake Township, Grundy County will enter into a contract with the Government whereby Goose Lake Township, Grundy County will grant the Government a right to enter, at reasonable times and in a reasonable manner, upon land which Gooselake Township, Grundy County owns or controls for access to the project for the purpose of inspection, and, if necessary, for the purpose of completing, operating, repairing, maintaining, replacing or rehabilitating the project. If an inspection shows that Goose Lake Township, Grundy County for any reason of failing to fulfill its obligations under the Agreement without receiving prior written approval from the Government, the Government will send a written notice to Goose Lake Township, Grundy County. If Goose Lake Township, Grundy County persists in such failure for 30 calendar days after receipt of notice, then the Government shall have a right to enter,

at reasonable times and in a reasonable manner, upon lands Goose Lake Township, Grundy County owns or controls for access to the project for the purpose of completing, operating, repairing, maintaining, replacing, or rehabilitating the project. No completion, operation, repair, maintenance, replacement, or rehabilitation by the Government shall operate to relieve Goose Lake Township, Grundy County of responsibility to meet its obligations as set forth in the Agreement, or to preclude the Government from pursuing any other remedy at law or equity to assure faithful performance pursuant to the Agreement.

Goose Lake Township, Grundy County is willing and able to pay its share of the total project costs. Sufficient funds are on hand or can be raised quickly, and the cash payment can be deposited directly with the Government upon demand by the Government.

This is to advise that if the Definite Project Report for this project is approved substantially in its present form as reviewed by Goose Lake Township, Grundy County and as submitted for approval by the Corps of Engineers higher authority, Goose Lake Township, Grundy County is willing, and legally and financially able, to sign the referenced Local Cooperation Agreement which includes the obligations set forth above.

Sincerely,



Bruce Trotter
Goose Lake Township
Highway Commissioner
525 N. Gorman Road
Mazon, Illinois 60444

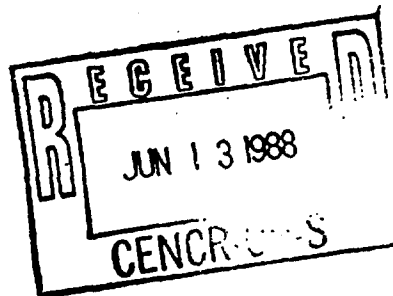


217/782-0610

Rock Island District Corps of Engineers
Bank Protection - Mazon River
Log # C - 434-88

June 14, 1988

Mr. Henry G. Pfiester, P.E.
Chief of Operations
Rock Island District
Corps of Engineers
Clock Tower Building
Rock Island, Illinois 61201



Dear Mr. Pfiester:

This Agency received a request on May 16, 1988, from the Rock Island District Corps of Engineers requesting necessary comments for environmental consideration concerning the placement of riprap along approximately 600 feet of bank on the Mazon River near Whitetie Road. We offer the following comments.

Based on the information included in this submittal, it is our engineering judgment that the proposed project may be completed without causing water pollution as defined in the Illinois Environmental Protection Act, provided the project is carefully planned and supervised.

These comments are directed at the effect on water quality of the construction procedures involved in the above described project and is not an approval of any discharge resulting from the completed facility, nor an approval of the design of the facility. These comments do not supplant any permit responsibilities of the applicant towards this Agency.

This Agency hereby issues certification under Section 401 of the Clean Water Act (PL 95-217), subject to the applicant's compliance with the following conditions:

1. The applicant shall not cause:
 - a. violation of applicable water quality standards of the Illinois Pollution Control Board, Title 35, Subtitle C: Water Pollution Rules and Regulations;
 - b. water pollution as defined and prohibited by the Illinois Environmental Protection Act; and
 - c. interference with water use practices near public recreation areas or water supply intakes.
2. The applicant shall provide adequate planning and supervision during the project construction period for implementing construction methods, processes and cleanup procedures necessary to prevent water pollution and control erosion.

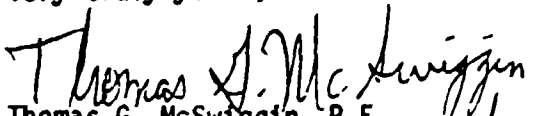


Page 2

3. Any spoil material excavated, dredged or otherwise produced must not be returned to the waterway but must be deposited in a self-contained area in compliance with all State statutes, regulations and permit requirements with no discharge to the waters of the State unless a permit has been issued by this Agency. Any back filling must be done with clean material and placed in a manner to prevent violation of applicable water quality standards.
4. All areas affected by construction shall be mulched and seeded as soon after construction as possible. The applicant shall undertake necessary measures and procedures to reduce erosion during construction. Interim measures to prevent erosion during construction shall be taken and may include the installation of staked straw bales, sedimentation basins and temporary mulching. All construction within the waterway shall be conducted during zero or low flow conditions.
5. This certification becomes effective when the Department of the Army, Corps of Engineers, includes the above conditions #1 through 4 as conditions of the requested permit issued pursuant to Section 404 of PL. 95-217.

This certification does not grant immunity from any enforcement action found necessary by this Agency to meet its responsibilities in prevention, abatement, and control of water pollution.

Very truly yours,


Thomas G. McSwiggin, P.E.
Manager, Permit Section
Division of Water Pollution Control



TGM:BY:jed/1643j/83-84

Attachment

cc: IEPA, DWPC, Records Unit
DWPC, Field Operations Section, Region 2
IDOT, Division of Water Resources, Schaumburg
USEPA, Region V



DEPARTMENT OF THE ARMY
ROCK ISLAND DISTRICT, CORPS OF ENGINEERS
CLOCK TOWER BUILDING - P.O. BOX 8004
ROCK ISLAND, ILLINOIS 61204-2004

REPLY TO
ATTENTION OF:

June 23, 1988

Planning Division

Mr. Theodore Hild
Deputy State Historic
Preservation Officer
Illinois Historic
Preservation Agency
Old State Capitol
Springfield, Illinois 62704

Dear Mr. Hild:

The Corps of Engineers, Rock Island District, is assisting the Goose Lake Township (Grundy County) in design plans for the protection of Whitetie Road. Whitetie Road, located in the NE1/4NE1/4SE1/4 sec. 30, T. 33 N., R. 8 E., is threatened by erosion from the nearby Mazon River (see enclosed map). The proposed bank protection consists of approximately 600 to 800 feet of riprap along the south bank of the Mazon River.

District Archeologist Floyd Mansberger and Biologist Joseph Slater conducted an archeological reconnaissance survey of the proposed project area on May 18, 1988. The project area consists of a narrow band immediately north of Whitetie Road. This high (35 to 40 feet), steep (1:1 slope) bank was precariously inspected for signs of cultural material. Although not to be impacted by the proposed construction, the agricultural field immediately south of Whitetie Road also was inspected. This area, with its excellent visibility (90-100 percent), was walked at 15m intervals. The only cultural material located by this survey was the remains of a late 19th/early 20th century trash dump eroding from the bank line near the east end of the project near the junction of Gorman and Whitetie Roads (see enclosed ASSR form).

A small amount (approximately 2,000 c.y.) of fill will be needed for this project. The borrow will come from an old strip-mined area within the N1/2 sec. 28, T. 33 N., R. 8 E., Grundy County.

INHA REVIEW
H/A _____
AC _____
AR Concur 7.10.88 PC
EM GR 7.10.88
204C. 1 St

Based on this information, it is our opinion that there are No National Register eligible Historic Properties present within the project area. The single historic archeological site located is not eligible for the National Register.

We request your comments on this project within 15 days. If you should have any questions concerning this project, please call Mr. Floyd Mansberger at 309/788-6361, Ext. 349, or you may write to the following address:

District Engineer
U.S. Army Engineer District, Rock Island
ATTN: Planning Division
Clock Tower Building - P.O. Box 2004
Rock Island, Illinois 61204-2004

Sincerely,

Charles R. Hanson
Dudley M. Hanson, P.E.
Chief, Planning Division *fr*

Enclosures

CONCUR
By: *Theodore H. Hef*
Deputy District Engineer & Preservation Officer
July 7, 1988

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46-WS/TP 11, 2100 SECOND STREET SW
WASHINGTON, DC 20593**

**FEDERAL EMERGENCY MANAGEMENT ADMIN, 500 C STREET SW
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19TH & C STREETS NW - ROOM 4241, WASHINGTON DC 20240**

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CHICAGO IL 60602**

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FEDERAL BLDG - 31ST FLOOR, 230 S DEARBORN ST
CHICAGO IL 60604**

**MR RICHARD NELSON - FIELD SUPVR, U.S.FISH & WILDLIFE SERVICE
1330 SECOND AVE. - 2ND FLOOR, ROCK ISLAND, IL 61201**

**STATE CONSERVATIONIST, SOIL CONSERVATION SVC USDA
301 N RANDOLPH, CHAMPAIGN IL 61820**

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US DEPT OF AGRICULTURE, 310 W WISCONSIN AVE-SUITE 500
MILWAUKEE WI 53203**

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STATE OF ILLINOIS, SPRINGFIELD, IL 62706**

**HONORABLE JAMES R THOMPSON, GOVERNOR OF ILLINOIS
STATE CAPITOL, SPRINGFIELD IL 62706**

**DIRECTOR, BUREAU OF SOIL & WATER CONS
IL DEPT OF AGRICULTURE, EMERSON BLDG-IL ST FAIRGROUNDS
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**MR MARK FRECH - DIRECTOR, ILLINOIS DEPT OF CONSERVATION
LINCOLN TOWER PLAZA, 524 SOUTH 2ND STREET
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GRUNDY COUNTY, 310 EAST DUPONT ROAD
MORRIS IL 60450**

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HIGHWAY COMMISSIONER, 525 NORTH GORMAN ROAD
MAZON IL 60444**

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TOWER BUILDING, ROCK ISLAND, IL 61204-2004

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CENCR-ED-D	CENCR-OD
CENCR-ED-H	CENCR-IM-C (3)
CENCR-PD	CENCR-PA